REMARKS

Claims 63 and 64 have been added. Claims 35-64 remain in the application. Reconsideration of the application in view of the amendments and the remarks to follow is requested.

The specification has been amended to correct and/or update the provenance data relative to the application. The amendments to the Figs. clarify the description of the invention. Support for the amendments to Fig. 13 may be found at least from p. 3, line 21, through p. 9, line 14 of the text of the specification as originally filed. No new matter has been introduced through the amendment of Fig. 13. Approval of the revised formal drawing of Fig. 13 is respectfully requested.

Claims 35, 36, 38-42, 45-48, 50-53 and 56-59 stand rejected under 35 U.S.C. 102(b) as being anticipated by Val, U.S. Patent No. 5,323,533. Claims 44, 49, 55 and 61 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Val, U.S. Patent No. 5,323,533. Claims 35, 36, 39, 40, 42, 43, 45, 47 and 48 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Loboda, U.S. Patent No. 6,268,262 in view of Numata et al., U.S. Patent No. 5,675,187 and Thomas et al., U.S. Patent No. 5,117,276. Claims 54 and 60 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Val, U.S. Patent No. 5,323,533 in view of Loboda, U.S. Patent No. 6,268,262. Claims 37 and 62 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Val, U.S. Patent No. 5,323,533 in view of Numata et al., U.S. Patent No. 5,675,187.

The §102 rejection of claim 35 is in error. The Examiner is referred to MPEP §2131, which recites, in part, that:

> To anticipate a claim, the reference must teach every element of the claim. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the ... claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Therefore, if the Applicant can identify even a single element provided by Applicant's claims that is not provided by Val, the §102 rejection is invalid and should be withdrawn.

Claims 35, 36, 50 and 56 each recite "Integrated circuitry comprising: a semiconductive substrate having an outer surface", which is not taught or disclosed by Val.

The Examiner states (p. 2) that Val teaches "a semiconductive substrate (E/12) having an outer surface". The Examiner is mistaken.

Val teaches (col. 1, line 64 et seq.) that the base E is formed of ceramic and comprises portions 11, 12 and 13. Accordingly, portions 11, 12 and 13 comprise ceramic, as taught by Val, and do not comprise a semiconductive substrate, as mistakenly alleged in the Office Action. In fact, Val is void of the term "semiconductor" or any variation thereof.

Claim 35 also recites "an inner conductive core spaced from and suspended over the outer surface; a polymer dielectric layer surrounding a

substantial portion of the inner conductive core; and an outer conductive sheath surrounding a substantial portion of the polymer dielectric layer", which is not taught or disclosed by Val.

The Examiner states (p. 2) that Val teaches "an inner conductive core (F) spaced from and suspended over the outer surface". The Examiner is mistaken. Val teaches (col. 2, lines 21-24; Fig. 2A) that "A wire F connects a pad P_{CI} of the component CI to a pad of the base, indexed P_{E2} and arranged, for example, on the layer 12; the wire F is, in general, made of gold or aluminum." The wire F is spaced from and suspended over a ceramic substrate, and is not an inner conductive core spaced from and suspended over the outer surface of the semiconductive substrate, as recited in combination with the other features of claim 35. wrong

Claims 36 and 56 each recite "a pair of spaced-apart terminal members disposed over the outer surface and extending elevationally away therefrom; an inner conductive core operably connected with and suspended between the spaced-apart terminal members above the outer surface", which is not taught or disclosed by Val. wrong

Inasmuch as Val fails to provide a semiconductor substrate having an outer surface, as recited in claims 36 and 56, it follows that Val further fails to provide a pair of spaced apart terminal members disposed over the outer surface of the semiconductive substrate, as recited in combination with the other features of claims 36 and 56. Further, Val fails to teach that the pair of terminal members extend elevationally away from the semiconductive

substrate outer surface, as affirmatively recited in claims 36 and 56. Additionally, Val fails to provide an inner conductive core operably connected with and suspended between the spaced-apart terminal members above the outer surface of the semiconductive substrate, as recited in claims 36 and 56.

Claim 50 recites "an inner conductive core spaced from and over the outer surface; a polymer dielectric layer surrounding a substantial portion of the suspended inner conductive core; and an outer conductive sheath surrounding a substantial portion of the polymer dielectric layer, the outer conductive sheath leaving some void space between the outer conductive sheath and the outer surface, wherein the outer conductive sheath is not formed on the outer surface", while claim 56 recites "an outer conductive sheath surrounding a substantial portion of the polymer dielectric layer while some void space is present between the dielectric layer over the suspended inner conductive core and the outer surface" and "the outer conductive sheath leaving some void space between the outer conductive sheath and the outer surface" 612

The Examiner states that Val teaches that "the outer conductive sheath leaves some void space between the outer conductive sheath and the outer surface". The Examiner is mistaken.

The void space in Figs. 2A-2C 3A-3D and 4 is explicitly shown to be above the ceramic substrate 11. As such, it is not a void space between the outer conductive sheath and the outer surface of a semiconductive substrate, as recited in claims 50 and 56.

Accordingly, the §102 rejection of claims 35, 36, 50 and 56 and claims dependent therefrom is invalid and should be withdrawn, and claims 35, 36, 50 and 56, and claims dependent therefrom, should be allowed.

The Examiner states (p. 3) that "Val fails to expressly teach using nickel as an inner conductive core. however [sic], the selection of a well-known material involves routine skill in the art." The Examiner also provides a similar rationale with respect to combining the teachings of Val and Loboda to provide a copper core (p. 5). The Examiner is mistaken on multiple grounds.

Applicants note the requirements of MPEP §2142, entitled "Legal Concept of Prima Facie Obviousness".

This MPEP section states that "To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. There is no such suggestion or motivation contained in the reference, and the Office Action makes no attempt to identify such in the reference.

Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Since none of the words "nickel", "cobalt" or "iron" appear anywhere in the reference, the reference cannot possibly teach or suggest all of the claim recitations. As a result, there cannot possibly be a reasonable expectation of

success. The rejection of claims 44, 49, 55 and 61 fails all three prongs of the test set forth in the MPEP for establishing a prima facie case of obviousness.

This MPEP section further states that "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)." Inasmuch as the rejection fails both latter prongs of the test for prima facie obviousness, it follows that neither of these requirements can be met.

Additionally, Val teaches (e.g., col. 2, lines 21-24) that the wire F comprises gold or aluminum. The wire F is shown coupled to pad P_{CI} of the component CI and to a pad of the base, indexed P_{E2}. Gold and aluminum are materials employed for wire bonds and are chosen for specific properties, including malleability, melting point, corrosion properties, metallurgical properties and conductivity, among others. A limited discussion of wire bonding techniques is presented in "Solid State Electronic Devices", by B.G. Streetman (copyright 1972 by Prentice Hall, Inc., Englewood Cliffs, NJ) at pages 380-383 to illustrate basics of this technology. Applicants are not aware of any technology for wire bonding using other materials, and the Examiner has not demonstrated that such technology exists. Accordingly, the bald assertion that materials choices are arbitrary is without foundation. The Examiner should either retract these remarks or provide appropriate support for them.

Accordingly, the unpatentability rejection of claims 44, 49, 55 and 61 is prima facie defective and should be withdrawn, and claims 44, 49, 55 and 61 should be allowed.

The Examiner states (p. 3) that "Loboda (Figs. 2-10) teaches an air bridge structure having a semiconductive substrate." The Examiner is mistaken.

Loboda is silent regarding the nature of the substrate. In fact, Loboda is void of the word "semiconductive" or any word with a similar root.

The Examiner also (correctly) states that "Loboda fails to teach the dielectric layer comprising parylene." and offers the teachings of Numata et al. to supply this missing element.

However, Loboda also discusses other dielectric materials (col. 1, lines 15-20) and rejects these collectively in favor of an air dielectric. Loboda teaches electrical, chemical and mechanical passivation of the airbridge using silicon carbide (see Abstract, Brief Description of the Invention, Detailed Description). Loboda explicitly teaches (col. 4, lines 3-11) that "These materials can include, for example, oxides, nitrides fluorinated materials, organic materials polymeric materials, and the like." with the proviso that (col. 4, lines 57-63) "Finally, the sacrificial material is etched to leave the air bridge. This is shown in FIG. 10 as void (14). The method of etching, again, is not critical and any known in the art can be used as long as the etching can be limited to the sacrificial material. These include, for example, dry etching (eg., with plasma), wet etching (eg., with aqueous

hydrofluoric acid) and/or laser ablation." The material must be removed in order to provide the advantages (col. 1, line 21) of an airbridge (Title, Abstract etc.) as taught by Loboda.

Accordingly, Loboda teaches away from use of parylene in a structure such as that of Applicant's claims and also teaches away from the disclosure of Numata et al. or Thomas et al. It is improper to attempt to combine teachings from references that teach away from one another, as is noted in MPEP §2145(X)(D)(2), entitled "References Cannot Be Combined Where Reference Teaches Away from Their Combination". wrong

This MPEP section states that "It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983)."

Loboda teaches that many benefits flow from usage of silicon carbide coatings on the substrate and on the airbridge (col. 1, lines 31-34; col. 2, lines 21-29; col. 4, line 64 through col. 5, line 3), including a physical barrier to prevent shorting and a hermetic seal protecting against corrosion. Indeed, Loboda teaches (col. 2, lines 21-23) that "The present invention is based on the discovery that the properties of amorphous silicon carbide (or "silicon carbide") can be used in the process of forming air bridges."

Accordingly, not only does Loboda teach away from the adaptations proposed in the Office Action, but the teachings of Loboda are rendered unsuitable for their intended purpose if adapted as proposed in the Office Action.

Numata et al. teach surrounding metal leads on a substrate to improve thermal conductivity and to avoid metal lead breakage due to Joule's heat (col. 3, lines 9-27 and line 56 through col. 4, line 3; col. 5, line 59 through col. 7, line 34 etc.). It is a main intent of Numata et al. to reduce thermal resistance between conductors and their surrounding environment. Thus, not only do Numata et al. teach away from the airbridge structures taught by Loboda, but the teachings of Numata et al. are rendered unsuitable for their intended purpose if adapted to be combined with the teachings of Loboda as proposed in the Office Action.

Thomas et al. is directed to a semiconductor device having a plurality of interconnects, and having a bulk of supporting metal material used as a ground plane and a heat sink (Abstract; Fig. 2B). Because at least one of objectives of Thomas et al. is to provide metal material as a heat sink, a substantial quantity is clearly provided and subsequently serves as a structural supporting element (Fig. 2B). Accordingly, Thomas et al. teach away from the claimed invention and from the teachings of Loboda. Additionally, the teachings of Thomas et al. are rendered unsuitable for their intended purpose if adapted to provide the claimed invention or if adapted to conform to the teachings of Loboda.

It is improper to employ a reference in a manner that renders the teachings of the reference unsuitable for their intended purpose, as is noted in MPEP §2143.01, entitled "Suggestion or Motivation to Modify the References".

This MPEP section states that "THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE". This MPEP section further states that "If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."

Accordingly, the rejections based on Loboda are prima facie defective and should be withdrawn, and claims 35, 36, 39, 40, 42, 43, 45, 47, 48, 54 and 62 should be allowed.

There is no teaching in the references to guide the artisan in selecting some but not other elements from Val and Numata et al., and then somehow to combine those selected elements to result in the invention as respectively recited by either of claims 37 or 62, as at least some of the necessary elements and a teaching or suggestion to combine them are completely missing from Val and Numata et al., alone or in any proper combination. The §103 rejections of claims 37 and 62 are defective and should be withdrawn, and claims 37 and 62 should be allowed.

New claims 63 and 64 have been added. Support for new claims 63 and 64 may be found at least from p. 1, line 20 through p. 9, line 14 of the text of the specification as originally filed. New claims 63 and 64 recite patentable subject matter and are allowable.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page(s) are captioned "**Version with markings to show changes made**".

In view of the foregoing, allowance of claims 35-64 is requested. The Examiner is requested to phone the undersigned in the event that the next Office Action is one other than a Notice of Allowance. The undersigned is available for telephone consultation at any time during normal business hours (Pacific Time Zone).

Respectfully submitted,

Dated: Sept. 13, 2002 By: _____

Frederick M. Fliegel, Ph.D.
Reg. No. 36,138

Ver ion with marking to show changes made

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/887,049
Filing Date ..... June 21, 2001
Inventor ..... Kie Y. Ahn
Assignee ..... Micron Technology, Inc.
Group Art Unit 2823
Examiner ..... J.J. Maldonado
Attorney's Docket No. MI22-1738
Title: Conductive Lines, Coaxial Lines, Integrated Circuitry, and Methods of Forming Conductive Lines, Coaxial Lines, and Integrated Circuitry

VERSION WITH MARKINGS TO SHOW CHANGES MADE ACCOMPANYING RESPONSE TO AUGUST 14, 2002 OFFICE ACTION

Deletions are bracketed, additions are underlined.

In the Specification

On page 1, the paragraph inserted after the title by the amendment dated June 21, 2001, has been amended as shown below:

CROSS REFERENCE TO RELATED APPLICATION

This patent application is a [Continuation] Divisional Application of U.S. Patent Application Serial No. 08/917,003, filed August 20, 1997, now U.S. Patent No. 6,294,455, entitled "Conductive Lines, Coaxial Lines, Integrated Circuitry, and Methods of Forming Conductive Lines, Coaxial Lines, and Integrated Circuitry", naming Kie Y. Ahn as inventor.

In the Drawings

Fig. 13 has been modified as shown in the marked-up-in-red copies of Fig. 13 enclosed herewith.

In the Claims

Claims 63 and 64 have been added.

END OF DOCUMENT